Doc Code: AP.PRE.REQ

PTO/SB/33 (07-05)
Approved for use through xx/xx/200x. OMB 0651-00xx
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PRE-APPEAL BRIEF REQUEST FOR REVIEW

Docket Number (Optional)
Old: 040071-245
New: 0119-155

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to "Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450" [37 CFR 1.8(a)]

on ______

Signature ______

Typed or printed name ______

Application Number	Filed
09/996,513	November 28, 2001

First Named Inventor
Johan NILSSON et al.

Art Unit	Examiner
2631	KUMAR, Pankaj

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This request is being filed with a notice of appeal.

The review is requested for the reason(s) stated on the attached sheet(s).
Note: No more than five (5) pages may be provided.

I am the

☐ applicant/inventor.

☐ assignee of record of the entire interest.
See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)

☒ attorney or agent of record.
Registration number 36,075.

☐ attorney or agent acting under 37 CFR 1.34.
Registration number if acting under 37 CFR 1.34 ______

[signature]
Signature

Kenneth B. Leffler
Typed or printed name

703-718-8884
Telephone number

May 15, 2006
Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

☐ *Total of ______ forms are submitted.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of	**MAIL STOP AF**
Johan NILSSON et al.	Group Art Unit: 2631
Application No.: 09/996,513	Examiner: KUMAR, Pankaj
Filed: November 28, 2001	Confirmation No.: 3520
For: METHOD AND APPARATUS FOR CHANNEL ESTIMATION USING PLURAL CHANNELS	

PRE-APPEAL BRIEF REQUEST FOR REVIEW

Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In conjunction with the Notice of Appeal filed concurrently herewith, reconsideration and allowance of the above-identified application are respectfully requested for at least the following reasons.

In a series of Office Actions, independent claims 1, 4, and 9 and dependent claim 10 have been rejected as allegedly being obvious in view of Strolle (USPN 6560299) alone (March 22, 2005 Office Action); Strolle alone or in combination with Lindbom (USPN 5,581,580) (September 9, 2005 Office Action); and Strolle alone or in combination with Lindbom and Kido et al. (USPN 5255202). The rejections of dependent claims 2-3, 5, and 11 have also relied, in part, on these various combinations of references. Each of these Office Actions has made at least the following clear errors:

- Asserting that Strolle's Power Estimators 402, 412 generate Applicants' claimed "channel estimates"; and
- Asserting that one skilled in the art at the time of Applicants' invention would have been motivated to modify Strolle's Power Estimators 402, 412 such that they would generate Applicants' claimed channel estimates.

These distinct arguments will be expanded upon below after a brief summary of exemplary embodiments of Applicants' invention.

As explained in the specification beginning at page 2, line 8, a base station most often transmits multiple physical channels. In TDMA systems, physical channels from the same base station are separated using time (and frequency if multiple carriers are used). In FDMA systems only frequency is used to separate different physical channels. In spread spectrum CDMA systems, codes are used to separate different users (and frequency if multiple carriers are used).

Regardless of the channel used, a received signal differs from the transmitted signal in various ways due to the effects of passing through the transmission medium. To recover (or "detect") the information symbols conveyed by the received signal, a receiver typically applies some form of baseband signal processing to the received sample stream. *Such baseband signal processing may be based on a model of the transmission medium. The model is often expressed as estimates of filter channel coefficients.*

Estimates of the channel tap coefficients can be determined by various channel tap estimation techniques. Accurate detection of the transmitted digital signal is dependent on having accurate estimates of the channel tap coefficients.

Each Base Station in a WCDMA system transmits on several physical channels. For several reasons, many of these physical channels contain pilot symbols that can be used to estimate channel properties. A pilot signal is typically one or more predetermined symbols that may be transmitted on its own channel or embedded in another channel and may be used for supervisory, control, equalization, continuity, synchronization, or reference purposes.

It is sought to derive an improved estimate of the channel tap coefficients by combining estimates generated independently from several physical channels. However, as explained in the specification beginning at page 11, line 7, the use of multiple received signals for estimating channel tap coefficients is complicated when the characteristics of the multiple received signals are too different. For example, errors occur when the received signals are derived from channels using different transmission powers, which is common in many modern communication systems. In a 3GPP system, dedicated and common channels are transmitted using different signals, which are often referred to as physical channels. The physical channels are separated by channelization codes and/or time-multiplexing. Depending on the configuration of the base station, these signals may, however, be transmitted through the same medium, thereby experiencing the same multipath. A DPCH and CPICH can be simultaneously received by a remote terminal, e.g., by different fingers of a rake receiver. The CPICH is broadcasted within each cell using a specific channelization

code and always without power control. The power of the CPICH is chosen so that mobiles even outside the cell boundary can receive it. Thus, the power of the CPICH will in many cases be much higher than the power of DPCH's. Furthermore, the DPCH will in most cases be transmitted using power control, which is used to limit the power used by each individual DPCH to what is needed for each mobile to receive each DPCH. *Thus, the transmission powers on each DPCH and the CPICH will in most cases differ by an amount unknown to the mobile. We refer to this difference as the gain offset*. Note also that the gain offset will vary in time due to power control.

To address this problem, embodiments defined by claim 1 practice a "method of determining a gain offset between transmission channels in a communication system, comprising the steps of: deriving a first set of channel estimates from symbols received through a first channel; deriving a second set of channel estimates from symbols received through a second channel; and determining the gain offset based on the first and second sets of channel estimates." (Emphasis added.) For purposes of clarification, claim 1 further defines "wherein each of the channel estimates is a model of one of the first and second channels, and includes one or more channel tap coefficients."

Independent claims 4 and 9 define similar features.

1. **Strolle's Power Estimators 402, 412 do not Generate Channel Estimates**

The most-recent (final) Office Action continues to assert that Strolle's power estimators 402, 412 generate channel estimates. The rationale for this assertion was explained in the September 9, 2005 Office Action as follows (see paragraph 3 of that Action): "[P]ower estimator is estimating the channel. When signals go through a channel, there is power in the channel. So a power estimate is an estimate of the channel."

Applicants respectfully disagree. The power estimators 402, 412 provide estimates of the power level of the *received signal*, not of the *channel*. For example, knowing that the power level of a received signal is low does not inform the receiver of whether the low signal level is a result of a high-power transmitted signal being subjected to highly attenuating channel, or whether the channel imposes relatively low attenuation and the signal was originally transmitted at a low power level.

The several Office Actions all ignore Strolle at column 8, lines 42-45, which teaches that "a power estimator is a signal level sensing circuit, which provides a measure of the signal level (in this case, power) for comparison with a target reference level 402, 412." It is

only after the gains are measured that Strolle's receiver is able to determine estimates of the two signal paths. This is apparent in Strolle at, for example: figure 1, which shows the Joint Equalizer (which includes the channel taps – See Strolle, e.g., at column 8, lines 6-20; and column 17, line12 through column 18, line 26) *following* far downstream of the power estimators 402, 412, and not receiving any power level signals from the power estimators 402, 412 (i.e., the power estimators 402, 412 do not play a part in the channel estimation needed for the equalizers).

2. **There was no Motivation for One of Ordinary Skill in the Art to Have Combined Strolle with Lindbom and Kido in a Manner That Would Have Resulted in Applicant's Claimed Combinations**

The final Office Action argues that "one of ordinary skill in the art, would have been motivated to combine the teachings of Strolle with Lindbom [(which is relied upon for disclosing "channel estimates")] because Strolle suggests estimation and data (something broad) in general and Lindbom suggests the beneficial use of channel estimation and symbols such as to adjust the gain in fading channels in the analogous art of communication."

This argument is flawed because even if, *arguendo*, one might consider it to be a generally good idea to employ Lindbom's channel estimates in Strolle, there is no reason why one would want to use them to replace the power estimators 402, 412 because the power estimators 402, 412 are neither disclosed nor suggested to be involved in equalization. Moreover, it is believed that the Office Action's suggested substitution would have left Strolle's arrangement inoperative for its intended purpose. See, e.g., M.P.E.P. §2143.01, V., page 2100-137 (Rev. 3, August 2005). Strolle's power estimators 402, 412 are part of a joint Automatic Gain Control (AGC) loop 16 for use in a diversity receiver. This arrangement needs to generate measurements of actual received signal power so that those measurements can be compared with target reference levels 408. Channel model information regarding how the channel modifies *all* signals that pass through it would not appear to be useful for this purpose.

The final Office Action further argues that "[(1)] it would have been obvious, to one or ordinary skill in the art, … to arrive at the channel estimates includes one or more channel tap coefficients as recited by the instant claims, because the combined teaching of Strolle with Kido suggest channel estimates includes one or more channel tap coefficients as indicated by the instant claims. [(2)] Furthermore, one of ordinary skill in the art, would have

been motivated to combine the teachings of Strolle with Kido because Strolle suggests channel gain estimates (something broad) in general and Kido suggests the beneficial use of channel gain estimates based on filter coefficients such as adjusting the gain to acquire a desired signal value even with frequency fluctuations (Kido col. 21 lines 49-54) in the analogous art of signal processing."

As to argument (1), this is at best an argument that it would have been obvious to try the combination, which is an improper argument in an obviousness rejection. See, e.g., M.P.E.P. §2145 X.B. Kido, which discloses the use of a filter in the context of digital signal processing methods and systems in an electric power system, has no relevance to channel estimation in a telecommunications system, and neither Kido nor Strolle offer any guidance as to how their teachings could be combined.

As to argument (2), this is again merely an argument that it would be generally beneficial to combine the teachings of Strolle with those of Kido. However, even if, *arguendo*, the assertion is true, there is no reason why one would want to have Strolle's power estimators 402, 412 generate filter coefficients, since what is needed at those points of Strolle's circuit are power estimates of the received signal, not "channel tap coefficients" as recited in Applicants' claims. Moreover, the Office's argument that Kido's filter should be employed in Strolle to "adjust[] the gain to acquire a desired signal value ..." certainly changes the operation of Strolle, which uses the power estimators 402, 412 to *measure* the received signal, not to adjust it.

For at least the foregoing reasons, it is respectfully requested that the rejections of claims 1-5 and 9-11 under 35 U.S.C. §103 over Strolle in various combinations with Lindbom and Kido be reconsidered and withdrawn.

The application is believed to be in condition for allowance. Prompt notice of same is respectfully requested.

Respectfully submitted,
Potomac Patent Group PLLC

By: [signature]
Kenneth B. Leffler
Registration No. 36,075

Date: May 15, 2006
P.O. Box 270
Fredericksburg, Virginia 22404
703-718-8884